Scandinavian Journal of Pain 4 (2013) 25–30

Contents lists available at SciVerse ScienceDirect

Scandinavian Journal of Pain

journal homepage: www.ScandinavianJournalPain.com

Observational studies

The association between physicians' attitudes to psychosocial aspects of low back pain and reported clinical behaviour: A complex issue

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ARTICLE INFO

Article history:
Received 8 May 2012
Received in revised form 20 August 2012
Accepted 22 August 2012

Keywords:
Low back pain
General practitioners
Attitudes
Psychosocial risk factors

ABSTRACT

Background and aims: Physicians' attitudes predict clinical decision making and treatment choices, but the association between attitudes and behaviour is complex. Treatment guidelines for non-specific low back pain (LBP) include recommendations of early assessment of psychosocial risk factors for chronic pain, patient education and reassurance. Implication of these principles is demanding, and many patients are not referred for appropriate treatments due to a lack of systematic screening of psychosocial risk factors for chronic pain. Even though health care providers recognise the need for psychosocial assessment in LBP, psychosocial issues are seldom raised in acute settings. The aim of this study is to evaluate how physicians' attitudes towards assessing psychological issues of LBP patients are associated with their treatment practice, and to assess if their clinical actions follow current treatment guidelines.
Methods: The study was a mixed methods study of primary care physicians ($n = 55$) in Finland. Physicians' attitudes were measured with a psychological subscale of attitudes to back pain scales for musculoskeletal practitioners (ABS-mp). Treatment practice of LBP was evaluated by asking physicians to describe a typical LBP treatment process and by asking them to solve a LBP patient case. Members of the research team individually evaluated the degree to which psychosocial issues were taken into account in the treatment process and in the patient case answer. Qualitative and quantitative data were combined to examine the role of attitudes in the treatment of LBP.
Results: The attitudes of physicians were generally psychologically oriented. Physicians who addressed to psychosocial issues in their treatment practice were more psychologically oriented in their attitudes than physicians who did not consider psychosocial issues. Only 20% of physicians mentioned psychosocial issues as being a part of the LBP patient's typical treatment process, while 87% of physicians paid attention to psychosocial issues in the LBP patient case. On the level of the treatment process, radiological investigations were over-represented and pain assessment, patient information and reassurance infrequently performed when compared to LBP guidelines.
Conclusions: Although primary care physicians were generally psychosocially oriented in their attitudes on LBP, psychological issues were inconsistently brought up in their reported clinical behaviour. Physicians recognised the need to assess psychosocial factors. Those who were psychologically oriented in their attitudes were more inclined to take psychosocial issues into account. However on a process level, evaluation and treatment of LBP featured biomechanical principles. LBP guidelines were only partially followed.
Implications: Clinical behaviour of physicians in the treatment of LBP is complex and only partly explained by attitudes.

1. Introduction

Low back pain (LBP) is one of the most common health limiting conditions in western countries with a lifetime prevalence of 60–85% [1,2]. In spite of its benign nature, non-specific LBP is associated with major economic costs in terms of work day loss and increased health care utilisation [3]. On an individual level,

DOI of refers to article: http://dx.doi.org/10.1016/j.sjpain.2012.11.005.
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http://dx.doi.org/10.1016/j.sjpain.2012.08.003

psychosocial risk factors increase the likelihood of an unfavourable and disabling course of back pain [4–8].

Reviews and treatment guidelines for LBP help physicians to direct clinical practice, improve health care quality and reduce the use of ineffective treatments [9–11]. In the early stages of an episode of non-specific LBP, guidelines recommend patient reassurance and information about the favourable prognosis, advice to stay active and prescription of analgesics, if needed. Being aware of psychosocial risk factors for chronic pain ("yellow flags") is emphasised, and early screening of patients' psychosocial condition and beliefs about their back pain is recommended [9,12,13]. Although physicians widely acknowledge guideline recommendations [14], adherence among physicians varies [15,16].

Although a biopsychosocial approach in the treatment of LBP is widely accepted, many patients with psychosocial risk factors for chronic pain are not referred for appropriate treatments due to a lack of systematic prognostic screening [17]. Psychosocial aspects of LBP pain are seldom discussed by general practitioners in an acute setting [18,19]. Instead, many general practitioners tend to focus more on medical explanations and treatments and less on lifestyle and psychosocial factors [20]. Although health care providers recognise the need for assessment of psychosocial factors [21], some patients may be reluctant to discuss their concerns with the clinician [22] making it difficult for the physician to bring up emotional issues and beliefs. Patients with LBP expect pain relief, information, instructions and patient-centred communication [23]. However, patients' emotional distress can influence physicians' attitudes and communication [24] and decrease willingness to consider psychosocial issues.

Health care professionals' attitudes and beliefs predict clinical decision making, treatment choices and recommendations, and they are also associated with the patients' attitudes and beliefs [25–32]. Understanding and predicting physicians' clinical behaviour is a challenging task [33], and the association between attitudes and behaviour is not straightforward [34]. Physicians' special interest in back pain has been associated with beliefs reflecting biomedical orientation towards LBP [35] whereas lower biomedical scores on attitude measurement have been associated with using of guidelines [36]. Studies on attitudes are often challenged by a tendency of the participants to represent themselves in a favourable light, which makes it difficult to know whether the respondent reports his or her actual behaviour or an ideal of it.

The aim of present study was to evaluate primary care physicians' attitudes towards considering psychological issues of a LBP patient, and to assess if attitudes are associated with reported treatment actions. We also wanted to find out if clinical treatment practice of LBP patients as described by their physicians follows the principles of current treatment guidelines.

2. Materials and methods

2.1. Participants

A convenience sample of 55 primary care physicians at 11 municipal primary care health centres in the Hospital District of Southwest Finland participated in the study between November 2006 and September 2007. These health centres participated in a prevention of chronic LBP project organised by Turku University Hospital Pain Clinic in 2006–2008. Questionnaires ($n = 145$) were sent 6 weeks before beginning of the project to the municipal primary care health centres and physicians were invited to take part in the research. Fifty-five physicians agreed to participate in this study. The study protocol was approved by Hospital District of Southwest Finland.

Table 1
Psychological subscale of the attitudes to back pain scale for musculoskeletal practitioners [32].

I explore the psychological problems that my patient is facing.
I often find myself providing psychological support to patients.
It is essential that I know about my patients' psychological difficulties.
I try to avoid probing into my patients' personal problems.[a]

[a] Reversed coding.

2.2. Socio demographics

Age, sex and years of work experience since graduation were recorded.

2.3. Attitudes and beliefs about LBP

Primary care physicians' attitudes and beliefs about LBP treatment were assessed using the psychological subscale of the attitudes to back pain scale for musculoskeletal practitioners (ABS-mp) questionnaire, which is a 19-item questionnaire designed to assess health care professionals' attitudes to back pain and their impact on clinical practice [37]. The psychological subscale of ABS-mp consists of four items which measure practitioners' willingness to consider psychological issues of their patients (see Table 1). Respondents rate each statement on a seven point Likert scale (1 = extremely disagree and 7 = extremely agree), and the highest possible total score is 28 (range 4–28). A mean score of 20 on the psychological subscale has been considered as high endorsement of psychosocial factors [38].

The questionnaire was translated into Finnish by a member of the research group (AV) and by a professional translator. Inconsistencies and differences in the translations were few and they were discussed by the research group to synthesise a version into which all agreed. A preliminary translation was piloted by seven health care professionals. No changes in the questionnaire were made as the respondents did not comment or report any problems with completing it.

2.4. LBP treatment practice in primary care

2.4.1. Typical treatment process of LBP

In order to map the typical clinical treatment practice of a LBP patient, primary care physicians were asked to "describe the typical process of a LBP patient in the health centre from the perspective of your own professional group". The aim of the process description was to find out the typical process of a LBP patient reflecting the respondents' actual, clinical behaviour. The number of each emerging topic concerning examination, assessment and treatment was calculated. Two members of the research team (AV and NH) individually evaluated if psychosocial issues were taken into account in the process description (0 = not taken into account and 1 = taken into account). If the physician mentioned emotional factors, patient's expectations, reassuring patient, assessment of psychosocial factors or consideration of psychosocial services as a treatment option, his/her answer was rated as 1. Dichotomous rating was chosen since the respondents' answers were short and only few if any psychosocial issues were raised up per answer.

2.4.2. Patient case

A LBP patient case was constructed by the research group (NH, AV and SS). The case (see Appendix A), consisting of approximately 200 words, described a patient with an episode of acute LBP, psychosocial risk factors ("yellow flags") and past episodes of musculoskeletal pain. The physicians were asked to provide a written description about how they would pursue in the

situation. The emerging topics concerning examination, assessment and treatment were assessed.

Three members of the research team (AV, NH and SS) individually evaluated the degree to which psychosocial issues were taken into account (1 = psychosocial issues not considered, 2 = psychosocial issues modestly considered and 3 = psychosocial issues well considered) in the answer. Between research team members there was complete agreement in 74% of evaluations. In 26% of the evaluations agreement was partial, indicating that 2 members had same judgement while one member disagreed. In 13 cases, the difference was between ratings 2 (psychosocial issues modestly considered) and 3 (psychosocial issues well considered), and in one case between ratings 1 (psychosocial issues not considered) and 2 (psychosocial issues modestly considered). Differences in the evaluations were discussed by the research group to synthesise a judgement to which all agreed.

2.5. Following of the LBP guidelines

A list of items about the principles of the assessment and management of a LBP patient was drawn from the international and national guidelines on LBP and prevention of LBP [9,12,13]. These items were pain assessment (localisation, intensity and neuropathic symptoms), ruling out specific causes (red flags), informing and reassuring patient, considering analgesic prescription, avoiding routine imaging or laboratory tests, considering psychosocial issues, prescribing short sick leave if needed, listing for a further appointment and considering physiotherapy treatment. Each comment on assessment, examination, treatment or rehabilitation of LBP was collected from the written process description and patient case answers. In addition, any comments related to referrals, clinical setting and health care practitioners nominated were gathered. The number of respondents mentioning each topic was then calculated and compared with the item list drawn from the guidelines.

2.6. Statistical analysis

The ABS-mp psychological subscale data was normally distributed (Kolmogorov–Smirnov = .95, $p > .05$) and parametric tests were chosen for quantitative statistical analysis. A reliability analysis of the ABS-mp psychological subscale using Cronbach's alpha was carried out to verify the suitability of the subscale for use in physicians' professional group, since the ABS-mp is originally developed for chiropractors, osteopaths and physiotherapists working in United Kingdom in primary care [37]. The subscale showed satisfactory internal consistency ($\alpha = .772$). Demographic variables were described with means and standard deviations (mean ± SD) or means and range. The association between demographic factors and ABS-mp psychological subscale was assessed using Pearson correlations and *t*-tests.

In order to examine the role of psychological attitudes in the assessment and management of LBP, qualitative and quantitative data were combined. Differences in attitudes between two groups based on the research team's evaluation of the existence of psychosocial issues in process description were examined using independent samples *t*-test. Univariate analysis of variance was used in evaluation of the differences in attitudes between groups based on the degree in which psychosocial risk factors of chronic pain are taken into account in the patient case. The latter was further analysed by contrast tests with Bonferroni correction, since assuming a directional effect of attitude towards action was considered justified.

Furthermore, the relationship between considering psychosocial issues in process description and patient case resolving was examined using Chi-square's tests.

Table 2
Topics emerging from primary care physicians' ($N = 54$) description of a typical process of low back pain. Number and percentage of physicians mentioning the topic.

Topic in the process description	*N*	%
Listed for a further appointment	38	70
Considering physiotherapy treatment	37	69
Radiological investigation	34	63
Medication	32	59
Referral to a specialist	30	56
Emergency clinic visit	29	54
Sick leave	29	54
Physical examination	14	26
Laboratory tests	9	17
Patient informing or reassuring	10	19
ENMG	7	13
Disability assessment or assessment of need of the rehabilitation	4	7
Referral to the psychologist	4	7
Nurse	3	6
Assessment of yellow flags by general practitioner	3	6

All statistical analyses were performed with the PASW Statistics 18.0 statistical software.

3. Results

3.1. Socio demographics

Fifty-four physicians (36 women and 18 men) with an average age of 42 years (range 25–63 years) completed the study and were included in the analysis. One physician completed only the ABS-mp and was therefore excluded from the analyses. The average work experience since graduation was 15 years (range 0–36 years).

3.2. Attitudes and beliefs about LBP

Physicians received relatively high scores in psychological subscale of ABS-mp (21 ± 4, range 12–28). The ABS-mp psychological subscale scores did not differ between genders and were not correlated with the respondents' age or years of work experience.

3.3. LBP treatment practice in primary care

In the description of the typical process of a LBP patient, the most frequent actions reported by the physicians were: listed for a further appointment (70%), considering physiotherapy treatment (69%) and radiological investigation (63%) (Table 2). In the patient case answer, the most often mentioned actions were considering or assessing psychosocial risk factors for chronic pain (87%), considering analgesic prescription (69%) and listed for a further appointment (65%).

In the description of the typical process of a LBP patient, psychosocial factors were addressed to some extent by 20% of the respondents. The most frequently mentioned psychosocial topics were: informing or reassuring the patient (19%), considering psychosocial issues (13%) and considering of psychosocial services as a treatment option (7%). 80% of the respondents did not address any psychosocial related issues at their process description. In the patient case, 87% of the respondents addressed psychosocial factors in their answer. The most often mentioned psychosocial topics were: considering or screening depression or alcohol consumption (78%), informing or reassuring patient (35%) and consideration of psychosocial services as a treatment option (20%).

3.4. Following of the LBP guidelines

The number of respondents mentioning each guideline topic (pain assessment, ruling out specific causes, informing and

Table 3
General practitioners' ($N = 54$) compliance with guidelines on management of low back pain (LBP). Number and percentage of the physicians mentioning topic concerned.

Guideline topic	LBP process description *N* (%)	LBP patient case *N* (%)
Pain assessment	6 (11)	3 (6)
Ruling out specific causes (red flags)	14 (26)	24 (44)
Informing or reassuring patient	10 (19)	19 (35)
Considering analgesic prescription	32 (59)	37 (69)
Radiological investigation	34 (63)	8 (15)
Laboratory tests	9 (17)	11 (20)
Considering psychosocial issues	7 (13)	47 (87)
Sick-leave	29 (54)	15 (28)
Listed for a further appointment	38 (70)	35 (65)
Considering physiotherapy treatment	37 (69)	17 (31)

reassuring patient, considering analgesic prescription, avoiding routine imaging or laboratory testing, considering psychosocial issues, prescribing short sick leave if needed, listing for a further appointment and considering physiotherapy treatment) in their LBP process description and LBP patient case answers was calculated. Compliance of general practitioners with LBP guidelines varied depending on the item. Only few respondents reported assessing pain in their LBP process description or LBP patient case answer. Ruling out red flags and providing patient information or reassurance were also relatively infrequently mentioned. More than half of the respondents reported radiological investigations to be a part of a typical LBP process. Results are summarised in Table 3.

3.5. Association of attitudes and beliefs with LBP treatment practice

Physicians who addressed to psychosocial factors in the process description had higher scores on the ABS-mp psychological subscale ($t(52) = -2.30$, $p < .05$) than those who did not. Contrast tests in the analysis of variance established that physicians who did not consider psychosocial factors in the patient case were less psychologically oriented in their attitudes than those who addressed these factors well ($t = 4.65$, $p < .05$) (Table 4). No statistically significant association was found between considering psychosocial issues in process description and patient case.

4. Discussion

Physicians' willingness to communicate with the patient on an emotional level is one of the prerequisites for the assessment of psychosocial risk factors of chronic pain. In our study, primary care physicians who addressed psychosocial factors in their clinical work were more psychologically oriented in their attitudes than physicians who did not consider psychosocial issues in their practice. These findings are in line with previous studies indicating that health care practitioners' beliefs and attitudes are associated with their recommendations to patients, clinical decision making and treatment choices [25,27,28,30,39–41].

All physicians reached relatively high scores on the ABS-mp psychological subscale, but consideration of psychosocial issues in the process description differed distinctly from the patient case. One in every five physicians addressed to psychosocial factors in their process description of a LBP patient. When plenty of cues of the patient's psychosocial status were presented in the patient case, 87% of the physicians paid attention to psychosocial factors and over a half of them made a plan to assess or assessed these. The discrepancy between the process description and patient case answers may be due to the fact that although a psychologically oriented attitude increases the likelihood of considering psychosocial issues in the consultation room, it may not be enough to produce clinical actions [42,43]. In attitudes and behaviour, a change is a complex and demanding process [44,45] and cognitive behavioural approach in training of health care practitioners' attitudes may be employed [31]. In the level of treatment process in our study, evaluation and treatment of LBP featured biomechanical principles despite of reported psychological-minded attitudes. Considering this discrepancy, cognitive-behavioural approach might be a possible way to elicit change.

Physicians' clinical decisions and treatment choices direct patients' course in the health care system. In our study, respondents' view of the typical process with frequent mentions of radiological investigation (63%) and referral to a specialist (56%) may reflect more a biomechanical rather than biopsychosocial perspective to LBP treatment. In previous studies, use of diagnostic investigations have been explained by patients' expectations, attempts to give patient "peace of mind" or habitual behaviour provoked by patients emotional distress, rather than actual clinical need [14,46].

Only few respondents included pain assessment in their process description and patient case answer and none reported use of pain intensity measurement scales. This was somewhat surprising since assessment of pain intensity, frequency and location are crucial in the diagnostics and choice of appropriate treatment and in evaluating treatment response [47]. In the present study, every third respondent mentioned informing or reassuring the patient in the patient case and even fewer mentioned it in the LBP treatment process description. This was remarkably few considering the amount of inactivity-based cues presented in patient case. Furthermore, avoidance and catastrophic interpretations of pain have been associated with the risk of persistent pain [48]. Successful reassurance and delivery of information is important for treatment since the interpersonal aspects of the health care provider–patient relationship appear to be critical for treatment outcome and patient satisfaction [49,50].

The findings in our study showed that guideline recommendations especially about avoiding radiological investigations in the acute phase and providing patient information or reassurance were relatively poorly followed. This is in line with previous studies which indicate that compliance with treatment guidelines varies among physicians [14–16,51], and that some primary care physicians do not to comply with evidence based LBP guidelines [52,53]. Non-compliance with treatment guidelines has been

Table 4
Differences in attitudes measured by psychological subscale of the attitudes to back pain scale for musculoskeletal practitioners [32] between groups based on research team evaluation of the degree to which psychosocial issues were considered in the patient case answer. Descriptive statistics and analysis of variance.

	Means and standard deviations			Univariate effects	
	1. Psychosocial issues not considered ($N = 7$)	2. Psychosocial issues modestly considered ($N = 28$)	3. Psychosocial issues well considered ($N = 19$)	$F(2, 51)$	Contrasts (Bonferroni corrected)
Psychological attitudes	17.4 (4.0)	21.1 (3.9)	22.5 (3.1)	6.59^{*}, $\eta^{2a} = .12$	1 < 3

* $p < .05$.
[a] Eta squared.

associated with practitioners' low confidence in their ability to provide evidence-based care, desire to avoid conflict with the patient [19], mistrust in the health care system [54] and clinicians' attitudes and beliefs [40,55].

There is ample evidence that psychosocial factors contribute to the risk of chronic LBP and influence treatment outcome [8,56,57]. In the patient case, plenty of cues of psychosocial risk factors were presented which enabled the physicians to include them in the treatment protocol. In the process description, no psychosocial cues were present which perhaps better reflected to a clinical situation. It is thus possible that the patient case was not considered as "typical" by the respondents and the difference in the consideration of psychosocial issues with the process description was therefore so remarkable. It could also be argued whether assessment of psychosocial risk factors or informing and reassuring patient can at all be considered as part of the health care process. However, physicians had included other acts of assessment and treatment in the process description, for example physical examination (26%) and medication prescription (59%). It is also possible that other factors such as organisational, physician-and interaction-based factors contributed to physician's reported clinical behaviour [19,58].

There are several limitations to our study. First, the cross-sectional design of our study should be emphasized when interpreting the results, which therefore are correlational in nature. We used the psychological subscale of the ABS-mp questionnaire to assess attitudes and beliefs of primary care physicians about LBP although it has originally been developed for chiropractors, osteopaths and physiotherapists [37] and usefulness of measurement tool for physicians in Finland is unclear. In addition, using a subscale instead of a whole instrument reduces the reliability of the measurement. Reliability analysis of the subscale showed satisfactory internal consistency which preliminarily suggests that it might be a potential tool also for physicians. However, further studies are needed. We chose this questionnaire because it is conceptualized to be used in assessing the impact of practitioners' attitudes on clinical practice, and because the items of the ABS-mp have been identified using semi-structured interviews of health care practitioners. On the contrary, the scales of other measurement tools such as pain attitudes and beliefs scale (PABS) [59] are originally adapted from questionnaires which measure patients' attitudes and beliefs. To our knowledge, at the time of our study, reliability of the reduced and adjusted format of PABS measurement tool had not been evaluated in a GP population. The number of respondents in our study was quite small although comparable with other qualitative studies [14,19,60]. Results cannot be generalized to other providers or other health care settings, even though the sample can be regarded as representative of physicians working in health care centres in Finland [61]. Another limitation is that we were not able to monitor actual clinical behaviour of physicians. We used self-descriptions of LBP process and a patient case as proxies even though they do not always reflect actual behaviour. However, previous studies have shown that case vignettes can be used as a tool for assessing variation in clinical practice and that case vignettes provide insight into physicians' actual clinical behaviour [62,63].

5. Conclusions

In conclusion, the results of this study indicate that general practitioners in Finland are generally psychosocially oriented in their attitudes towards LBP and recognise the need for assessment of psychosocial factors. However, this orientation is only partly reflected in their reports of LBP clinical management. In the process level, evaluation and treatment of LBP features biomechanical principles. Clinical behaviour is a complex, dynamic process and insufficiently explained by explicitly measured attitudes. Especially on the level of treatment process, it seems that radiological investigations are over-represented and patient reassurance and other interaction-based methods are underused as treatment options. This suggests only partial adherence to evidence based LBP guidelines.

Conflict of interest

None of the authors has any conflicts of interests that may arise as a result from this research.

Acknowledgements

We want to thank research nurse Irma Laurila for her invaluable help with data collection and the Finnish Association for the Study of Pain, Helsinki, Finland for financial support.

Appendix A. Patient case

A forty-two year old woman limping her left leg appears at your emergency room. She reports having suffered from back pain for four days. The pain started as she was cleaning the windows of her apartment, but it made her stop the work. The left side of her back hurts most, but she also feels pain in her left buttock and some tightness in the upper part of her thigh. In addition, her right wrist feels numb. The patient reports taking paracetamol and ibuprofen for the pain, but they have not helped. As you are examining the patient, you notice that the long muscles next to her lumbar spine are tense and forward flexion of the back is limited. Tendon reflexes at lower extremities are symmetrical.

Medical records show that your patient has arterial hypertension and hay fever, and that she has visited emergency services 15 months earlier because of muscle tension in the neck and shoulders, 12 and 7 months earlier for pain in the right elbow and 3 months earlier for acute lower back pain, for which she received sick leave from office work. The patient reports that she has tried to manage her pain by resting and "taking it easy", and that she has given up her gym activities concurrently with the findings of neck-shoulder pain, because she felt exercise was making the pain problems worse. She also reports socializing less frequently with her friends, because she feels tired and stressed. Laboratory tests show elevated liver function tests. An ECG has been conducted a year earlier because of arrhythmia, but it was interpreted as normal. Radiological investigations have not been conducted. The patient is a divorced single mother of two children. She is asking for a prescription for sleep medication. How do you proceed?

References

[1] Woolf AD, Pfleger B. Burden of major musculoskeletal conditions. Bull World Health Organ 2003;81:646–56.
[2] Krismer M, van Tulder M. Low back pain (non-specific). Best Pract Res Clin Rheumatol 2007;21:77–91.
[3] Gore M, Sadosky A, Stacey BR, Tai KS, Leslie D. The burden of chronic low back pain: clinical comorbidities, treatment patterns, and healthcare costs in usual care settings. Spine 2012;37:E668–77.
[4] Pincus T, Burton AK, Vogel S, Field AP. A systematic review of psychological factors as predictors of chronicity/disability in prospective cohorts of low back pain. Spine 2002;27:E109–20.
[5] Shaw WS, Pransky G, Patterson W, Winters T. Early disability risk factors for low back pain assessed at outpatient occupational health clinics. Spine 2005;30:572–80.
[6] Leeuw M, Goossens ME, Linton SJ, Crombez G, Boersma K, Vlaeyen JW. The fear-avoidance model of musculoskeletal pain: current state of scientific evidence. J Behav Med 2007;30:77–94.
[7] van der Windt DAWM, Kuijpers T, Jellema P, van der Hejden G, Bouter LM. Do psychological factors predict outcome in both low-back pain and shoulder pain? Ann Rheum Dis 2007;66:313–9.
[8] Ramond A, Bouton C, Ruchard I, Roquelayre Y, Baufreton C, Legrand E, Huez JF. Psychosocial risk factors for chronic low back pain in primary care—a systematic review. Fam Pract 2011;28:12–21.

[9] Burton AK, Balaque F, Cardon G, on behalf of the COST B13 Working Group on Guidelines for Prevention in Low Back Pain. Chapter 4. European guidelines for prevention in low back pain: November 2004. Eur Spine J 2006;15(Suppl. 2):S136–68.
[10] Van Tulder M, Becker A, Bekkering T, on behalf of the COST B13 Working Group on Management of Acute Low Back Pain in Primary Care. Chapter 3. European guidelines for the management of the acute nonspecific low back pain in primary care. Eur Spine J 2006;15(Suppl. 2):S136–68.
[11] Koes BW, van Tulder M, Lin C-WC, Macedo LG, McAuley J, Maher C. An updated overview of clinical guidelines for the management of nonspecific low back pain in primary care. Eur Spine J 2010;19:2075–94.
[12] Balagué F, Mannion AF, Pellisé F, Cedraschi C. Clinical update: low back pain. Lancet 2007;369:726–8.
[13] Working group set by the Finnish Medical Society Duodecim and the Finnish Society of Physical and Rehabilitation Medicine. Adult lower back disorders. Current care guideline. Helsinki: Finnish Medical Society Duodecim; 2008. Available online at: www.kaypahoito.fi.
[14] Corbett M, Foster NA, Ong P. GP attitudes and self-reported behaviour in primary care consultations for low back pain. Fam Pract 2009;26:359–64.
[15] Schers H, Braspenning J, Drijver R, Wensing M, Grol R. Low back pain in general practice: reported management and reasons for not adhering to the guidelines in the Netherlands. Br J Gen Pract 2000;50:640–4.
[16] Bishop PB, Wing PC. Compliance with clinical practice guidelines in family physicians managing worker's compensation board patients with acute lower back pain. Spine J 2003;3:442–50.
[17] Hill JC, Whitehurst DG, Lewis M, Bryan S, Dunn KM, Foster NE, Konstantinou K, Main JC, Mason E, Somerville S, Sowden G, Vohora K, Hay EM. Comparison of stratified primary care management for low back pain with current best practice (STarT Back): a randomised controlled trial. Lancet 2011;378:1560–71.
[18] Feuerstein M, Hartzell K, Rogers HL, Marcus SC. Evidence based practice for acute low back pain in primary care: patient outcomes and cost of care. Pain 2006;127:140–9.
[19] Breen A, Austin H, Champion-Smith C, Carr E, Mann E. You feel so hopeless: a qualitative study of GP management of acute low back pain. Eur J Pain 2007;11:21–9.
[20] Shaw WS, Pransky G, Winters T, Tveito TH, Larson S, Mö mRoter DL. Does the presence of psychosocial "yellow flags" alter patient–provider communication for work-related, acute low back pain? J Occup Environ Med 2009;51:1032–40.
[21] Bishop A, Foster NE. Do UK physical therapists recognise psychosocial yellow flags in patients with acute low back pain? Spine 2005;30:1316–22.
[22] Shaw WS, Pransky G, Roter DL, Winters T, Tveito TH, Larson SM. The effects of patient–provider communication on 3-month recovery from acute low back pain. J Am Board Fam Med 2011;24:16–25.
[23] Verbeek J, Sengers M-J, Riemens L, Haafkens J. Patient expectations of treatment for back pain. A systematic review of qualitative and quantitative studies. Spine 2004;29:2309–18.
[24] Gulbrandsen P, Madsen HB, Benth JS, Laerum E. Health care providers communicate less well with patients with chronic low back pain—a study of encounters at a back clinic in Denmark. Pain 2010;150:458–61.
[25] Rainville J, Carlson N, Polatin P, Gatchel RJ, Indahl A. Exploration of physicians' recommendations for activities in chronic low back pain. Spine 2000;25:2210–20.
[26] Linton SJ, Vlaeyen J, Ostelo RW. The back pain beliefs of health care providers: are we fear-avoidant? J Occup Rehabil 2002;12:223–32.
[27] Houben RM, Ostelo RW, Vlaeyen JW, Wolters PM, Peters M, Stomp-van den Berg SG. Health care providers' orientations towards common low back pain predict perceived harmfulness of physical activities and recommendations regarding return to normal activity. Eur J Pain 2005;9:173–83.
[28] Rainville J, Pransky G, Indahl A, Mayer EK. Physicians as disability advisor for patients with musculoskeletal complaints. Spine 2005;30:2579–84.
[29] Werner EL, Ihlebaek C, Skouen JS, Laerum E. Beliefs about back pain in the Norwegian general population: are they related to pain experiences and health professionals. Spine 2005;30:1770–6.
[30] Bishop A, Foster NA, Thomas E, Hay EM. How does the self-reported clinical management of patients with low back pain relate to the attitudes and beliefs of health care practitioners? A survey of UK general practitioners and physiotherapists. Pain 2008;135:187–95.
[31] Darlow B, Fullen BM, Dean S, Hurley DA, Baxter GD, Dowell A. The association between health care professional attitudes and beliefs, clinical management, and outcome of patients with low back pain: a systematic review. Eur J Pain 2012;16:3–17.
[32] Werner EL, Cote P, Fullen BM, Hayden JA. Physicians' determinants for sicklisting LBP patients. A systematic review. Clin J Pain 2012;28:364–71.
[33] Grimshaw JM, Eccles MP, Steen N, Pitts NB, Glidewell L, Maclennan G, Thomas R, Bonetti D, Walker A. Applying psychological theories to evidence-based clinical practice: identifying factors predictive of lumbar spine X-ray for low back pain in UK primary care practice. Implement Sci 2011;6:55.
[34] Houben RMA, Gijsen A, Peterson J, de Jong PJ, Vlaeyen JWS. Do health care providers' attitudes towards back pain predict their treatment recommendations? Differential predictive validity of implicit and explicit attitude measures. Pain 2005;114:491–8.
[35] Buchbinder R, Staples M, Jolley D. Doctors with a special interest in back pain have poorer knowledge about how to treat back pain. Spine 2009;34:1218–27.
[36] Fullen BM, Baxter GD, Doody C, Daly LE, Deirdre AH. General practitioners' attitudes and beliefs regarding the management of chronic low back pain in Ireland: a cross-sectional survey. Clin J Pain 2011;27:542–9.
[37] Pincus T, Vogel S, Santos R, Breen A, Foster N, Underwood M. The attitudes to back pain scale in musculoskeletal practitioners (ABS-mp). The development and testing of new questionnaire. Clin J Pain 2006;22:378–86.
[38] Pincus T, Foster N, Vogel S, Santos R, Breen A, Underwood M. Attitudes to back pain amongst musculoskeletal practitioners: a comparison of professional groups and practice settings using ABS-mp. Man Ther 2007;12:167–75.
[39] Buchbinder R, Jolley D, Wyatt M. Population based intervention to change back pain beliefs and disability: three part evaluation. BMJ 2001;322:1516–20.
[40] Coydeyre E, Rannou F, Tubach F, Baron G, Coriat F, Brin S, Revel M, Poiraudeau S. General practitioners' fear-avoidance beliefs influence their management of low patients with low back pain. Pain 2006;124:330–7.
[41] Poiraudeau S, Rannou F, Le Henanff A, Coudeyre E, Rozenberg S, Huas D, Martineau C, Jolivet-Landreau I, Revel M, Ravaud P. Outcome of subacute low back pain: influence of patients' and rheumatologists' characteristics. Rheumatology 2006;45:718–23.
[42] Jellema P, van der Windt DA, van der Horst HE, Blankenstein AH, Bouter LM, Stalman WA. Why is a treatment aimed at psychosocial factors not effective in patients with (sub)acute low back pain? Pain 2005;118:350–9.
[43] Overmeer T, Boersma K, Main CJ, Linton SJ. Do physical therapists change their beliefs, attitudes, knowledge, skills and behaviour after a biopsychosocially orientated university course? J Eval Clin Pract 2009;15:724–32.
[44] Werner EL, Gross DP, Lie SA, Ihlabaek C. Health care provider back pain beliefs unaffected by a media campaign. Scan J Prim Health Care 2008;26:50–6.
[45] Sanders T, Foster NE, Ong BN. Perceptions of general practitioners towards the use of a new system for treating back pain: a qualitative interview study. BMC Med 2011;9:49.
[46] Ring A, Dowrick C, Humphris G, Salmon P. Do patients with unexplained physical symptoms pressurise general practitioners for somatic treatment? A qualitative study. BMJ 2004;328:1057–62.
[47] Mannion AF, Balagué F, Pellisé F, Cedrashi C. Pain measurement in patients with low back pain. Nat Clin Pract Rheumatol 2007;3:610–8.
[48] Dunn KM, Croft PR. Repeat assessment improves the prediction of prognosis in patients with low back pain in primary care. Pain 2006;126:10–5.
[49] Dibbelt S, Schaidhammer M, Fleischer C, Greitemann B. Patient–doctor interaction in rehabilitation: the relationship between perceived interaction quality and long-term treatment results. Patient Educ Couns 2009;76:328–35.
[50] Hirsh AT, Atchison JW, Berger JJ, Waxenberg LB, Lafayette-Lucey A, Bulcourf BB, Robinson ME. Patient satisfaction with treatment for chronic pain. Predictors and relationship to compliance. Clin J Pain 2005;21:302–10.
[51] Engers AJ, Wensing M, van Tulder MW, Timmermans A, Oostendorp RA, Koes BV, Grol R. Implementation of the Dutch low back pain guideline for general practitioners: a cluster randomized controlled trial. Spine 2005;30: 595–600.
[52] Webster BS, Courtney TK, Huang Y-H, Matz S, Christiani DC. Physicians' initial management of acute low back pain versus evidence-based guidelines. J Gen Intern Med 2005;20:1132–5.
[53] Fullen BM, Baxter GD, O'Donovan BG, Doody C, Daly LG, Hurley DA. Factors impacting on doctors' management of acute low back pain: a systematic review. Eur J Pain 2009;13:908–14.
[54] Pincus T, Vogel S, Breen A, Foster N, Underwood M. Persistent back pain—why do physical therapy clinicians continue treatment? A mixed methods study of chiropractors, osteopaths and physiotherapists. Eur J Pain 2006;10: 67–76.
[55] Houben RM, Vlaeyen JW, Peters M, Ostelo RW, Pieter MJ, Stomp-van den Berg SG. Health care providers' attitudes and beliefs towards common low back pain: factor structure and psychometric properties of the HC-PAIRS. Clin J Pain 2004;20:37–44.
[56] Main CJ, Foster NE, Buchbinder R. How important are back pain beliefs and expectations for satisfactory recovery from back pain. Best Pract Res Clin Rheumatol 2010;24:205–17.
[57] Nicholas MK, Linton SJ, Watson PJ, Main CJ. Early identification and management of psychological risk factors ("yellow flags") in patients with low back pain: a reappraisal. Phys Ther 2011;91:737–53.
[58] Berguin A, Grisart J. To prescribe or not to prescribe. . .(in chronic pain. . .and elsewhere. . .)? Ann Phys Rehabil Med 2011;54:465–77.
[59] Ostelo RW, Stomp-van den Berg SG, Vlaeyen JW, Wolters P, De Vet HCW. Health care provider's attitudes and beliefs towards chronic low back pain: the development of questionnaire. Man Ther 2003;8:214–22.
[60] Harding G, Campbell J, Parsons S, Rahman A, Underwood M. British pain clinic recognition and use of biopsychosocial pain management model for patients when physical interventions are ineffective or inappropriate: results of a qualitative study. BMC Musculoskelet Disord 2010;11:51.
[61] Physicians in Finland. Statistics on physicians and the health care system. Helsinki: The Finnish Medical Association; 2011. Available on line at: www.laakariliitto.fi/files/LL_vuositilasto2011_net_2.pdf.
[62] Veloski J, Tai S, Evans AS, Nash DB. Clinical vignette-based surveys: a tool for assessing physician practice variation. Am J Med Qual 2005;20:151–7.
[63] Peabody JW, Luck J, Glassmann P, Jain S, Hansen J, Spell M, Lee M. Measuring the quality of physician practice by using clinical vignettes: a prospective validation study. Ann Intern Med 2004;16:771–80.